Amendments To The Claims:

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims:

1. (Currently Amended) A method of electronically adjusting an image to compensate for laser beam process direction position errors in an electrophotographic apparatus comprising:

reading image data from a first memory location, said image data comprising pixels arranged in a plurality of columns and a plurality of rows;

performing pixel shifts on select columns of said image data based upon a bow profile that characterizes process direction position errors of Pels written by a laser beam as it traverses generally in a scan direction to define adjusted image data<u>, wherein said bow profile comprises an instruction for each column of said image data indicating whether that column should be shifted up, down, or not shifted with respect to an adjacent column position</u>;

storing said adjusted image data to a second memory location; and

deriving a laser signal from said adjusted image data in said second memory location such that said laser signal corresponds to said pixel shifted version of said image data that is pre-warped in said process direction in a manner corresponding to said bow profile.

2. (Original) The method according to claim 1, wherein said first and said second memory locations comprise first and second areas of a main system memory.

3. (Original) The method according to claim 1, wherein said second memory location stores said adjusted image data for less than the entirety of said image.

4. (Currently Amended) The method according to claim 1, further comprising:

organizing said image data into a plurality of bands, each band comprising a predetermined number of columns and a predetermined number of rows of pixels of said image data, wherein <u>each band is further organized into a plurality of sections where each section has a predetermined number of columns less than the entirety of columns of its corresponding band and </u>pixel shifts are performed on select columns of each band based upon said bow profile <u>by</u>

<u>processing each band one section at a time, wherein</u> [[and]] said plurality of bands are processed one band at a time.

5. (Original) The method according to claim 4, wherein said second memory location is dimensioned to store at least two bands of adjusted image data.

6. (Original) The method according to claim 5, wherein a first band of adjusted image data is processed from said second memory location for deriving said laser signal while pixel shifts are performed on said image data according to said bow profile such that a second band of adjusted image data is stored in said second memory location.

7. (Original) The method according to claim 6, wherein processing of said first band of adjusted image data to derive said laser signal must be complete before storing a third band of adjusted image data into said second memory location.

8. (Original) The method according to claim 4, wherein said second memory location comprises a destination buffer and an overflow buffer, wherein performing pixel shifts comprises:

performing pixel shifts according to said bow profile on a select band;

storing the results in said destination buffer; and

storing pixels that were shifted out of said select band into said overflow buffer.

9. (Canceled)

10. (Original) The method according to claim 8, further comprising an output buffer that contains the contents of a select one of said destination and overflow buffers after processing a previous band, wherein said laser signal is derived from said output buffer.

11. (Original) The method according to claim 10, wherein as each band is processed, the previous band from said destination buffer becomes the new data for said output buffer and the data in said overflow buffer is incorporated into the next destination buffer.

12. (Original) The method according to claim 10, wherein as each band is processed, the previous band from the overflow buffer becomes the new data for said output buffer and the previous output of said destination buffer becomes the new data for said overflow buffer.

13. (Original) The method according to claim 10, wherein said destination, overflow and output buffers are each identified by a pointer to a unique area of said second memory location and as each new band of image data is processed, said pointers circularly rotate so that each buffer serves as the destination, overflow and output buffer for every third band that is processed.

14. (Cancelled)

15. (Currently Amended) The method according to claim[[14]] 1, further comprising constraining said instructions according to rules that limit the number of process direction shifts that can be corrected.

16. (Cancelled)

17. (Currently Amended) The method according to claim[[14]] 1, wherein each column includes a one-bit instruction that describes whether the bow processor should perform a relative pixel shift.

18. (Original) The method according to claim 17, wherein said instructions are constrained to limit the maximum amplitude of pixel shifts allowable in said bow profile.

19. (Original) The method according to claim 1, wherein said pixel shifts are performed from the top to the bottom of said image.

20. (Original) The method according to claim 1, wherein said pixel shifts are performed from the bottom to the top of said image.

21. (Currently Amended) A system for electronically adjusting image data to compensate for laser beam process direction position errors in an electrophotographic device comprising:

a ~~first~~ main memory location for storing image data;

a first memory location for storing first adjusted image data;

a second memory location for storing second adjusted image data;

~~a printhead operable to emit a laser beam across a scan path, said laser beam exhibiting process direction position errors; and~~

a first laser beam operable to sweep across a first scan path to write print elements that are associated with a first color image plane of said image data, said first laser beam exhibiting first process direction position errors;

a second laser beam operable to sweep across a second scan path to write print elements that are associated with a second color image plane of said image data, said second laser beam exhibiting second process direction position errors; and

a bow processor operatively configured to selectively obtain said image data from said ~~first~~ main memory location, apply pixels shifts on select columns of said image data ~~based upon a bow profile that characterizes said laser beam process direction position errors of Pels written by said laser beam to define adjusted image data,~~ and store said adjusted image data ~~in said second memory location; and~~

wherein:

said bow processor applies pixels shifts on columns of the selected image data based upon a first bow profile that characterizes said first process direction position errors of Pels written by said first laser beam when processing image data associated with said first color image plane to define first adjusted image that is pre-warped in the process direction in a manner corresponding to said first bow profile, said first adjusted image data stored in said first memory location;

said bow processor applies pixels shifts on columns of the selected image data based upon a second bow profile that characterizes said second process direction position errors of Pels written by said second laser beam when processing image data associated with said second color image plane to define second adjusted image data that is pre-warped in the process direction in a manner corresponding to said second bow profile, said second adjusted image data stored in a second memory location;

~~a video processor operatively configured to derive~~ a first laser signal ~~suitable for processing by said printhead~~ modulates said first laser beam based upon ~~by reading~~ said first adjusted image data; ~~data from said second memory location, such that said laser signal corresponds to said pixel shifted version of said image data that is pre-warped in said process direction in a manner corresponding to said bow profile~~ and

a second laser signal modulates said second laser beam based upon said second adjusted image data.

22. (Currently Amended) The system according to claim 21, wherein said image data is transferred to said bow ~~processor and~~ processor, said bow processor writes said first adjusted image data to said first memory location and said bow processor writes said second adjusted image data to said second memory location using direct memory access transactions.

23. (Currently Amended) The system according to claim 21, further comprising a third memory location, wherein said ~~bow profile is~~ first and second bow profiles are stored in said third location as a plurality of instructions that describe the process direction shifts for corresponding Pel positions along ~~said scan path~~ their associated scan paths required to compensate for said laser beam process direction position errors.

24. (Original) The system according to claim 21, wherein said bow processor is implemented in an application specific integrated circuit.

25. (Currently Amended) The system according to claim 21, further comprising a queue accessible by said bow processor for temporarily storing and prioritizing sections of said image data prior to said bow processor applying said pixel shifts to said image data.

26. (Original) The system according to claim 21, wherein said electrophotographic device comprises a color device, and said bow processor performs pixel shifts for each of the cyan, yellow, magenta and black image planes.

27. (Currently Amended) The system according to claim 21, wherein ~~said second memory location~~ each of said first and second memory locations includes a destination buffer, an overflow buffer and an output buffer, and wherein said system further comprising at least one control buffer in data communication with said bow processor that points to the location in said first memory location of said destination, overflow and output buffers, and at least one control buffer in data communication with said bow processor that points to the location in said second memory location of said destination, overflow and output buffers.

28. (Currently Amended) The system according to claim 21, further comprising a microprocessor operatively configured to derive said ~~pixel shift instructions~~ first and second bow profiles based upon data stored on ~~said~~ a corresponding printhead.

29. (Original) A method for electronically altering image data to compensate for laser beam process direction position errors in an electrophotographic device comprising:

storing said image data to be printed in memory;

dividing said image data up into a plurality of sections; and

for each of said plurality of sections of said image data:

selectively performing process direction shifts of image data in said section according to a bow profile that characterizes process direction position errors of Pels written by a laser beam as it traverses generally in a scan direction, to define adjusted image data for that section of said image data;

storing said adjusted image data in a destination buffer;

capturing adjusted image data shifted out of said section in an overflow buffer; and

outputting said adjusted image data to a printhead.

30-38. (Cancelled)

39. (New) The method according to claim 29, wherein:

dividing said image data up into a plurality of sections comprises organizing said image data into a plurality of bands, each band comprising a predetermined number of columns and a predetermined number of rows of pixels of said image data, wherein each band is further

organized into a plurality of said sections where each section has a predetermined number of columns less than the entirety of columns of its corresponding band, wherein pixel shifts are performed on select columns of each band based upon said bow profile by processing each band one section at a time and said plurality of bands are processed one band at a time.

further comprising:

an output buffer that contains the contents of a select one of said destination and overflow buffers after processing a previous band, wherein said laser signal is derived from said output buffer.

40. (New) The method according to claim 39, wherein as each band is processed, the previous band from said destination buffer becomes the new data for said output buffer and the data in said overflow buffer is incorporated into the next destination buffer or the previous band from the overflow buffer becomes the new data for said output buffer and the previous output of said destination buffer becomes the new data for said overflow buffer.

41. (New) The method according to claim 39, wherein said destination, overflow and output buffers are each identified by a pointer to a unique area of said second memory location and as each new band of image data is processed, said pointers circularly rotate so that each buffer serves as the destination, overflow and output buffer for every third band that is processed.

42. (New) The method according to claim 1, further comprising:

defining said bow profile to have a plurality of adjacent column positions;

encoding into each column position, a value that indicates whether a process direction shift should occur in said image data; and

for each column position where a process direction shift is to occur, encoding a value that indicates a shift direction in the next adjacent column location.

43. (New) The method according to claim 42, wherein each shift comprises a jump of one row of image data in the process direction relative to an adjacent column position.

44. (New) The method according to claim 42, wherein each column position is associated with a predetermined location along a corresponding laser beam scan path and is represented by a one-bit value.

45. (New) The method according to claim 44, wherein shifts are encoded by identifying whether a change in direction should occur relative to a previously determined direction.

46. (New) The method according to claim 42, further comprising applying process direction position shifts to said image data comprising:

identifying a corresponding column in said bow profile for each print element of said image data being considered; and

if said corresponding column indicates a shift:

reading the next adjacent column in said bow profile;

determining a direction for said shift based upon a value stored in the next adjacent column; and

performing a process direction shift of at least one print element of said image data in the determined direction; and

if said corresponding column indicates no shift:

positioning a corresponding print element of said image data in the same row as the most previously placed print element of said image data.

47. (New) The method according to claim 42, wherein said bow profile is encoded part of an instruction.

48. (New) The method according to claim 47, wherein each instruction further encodes a current shift direction.

49. (New) The method according to claim 42, further comprising dividing said bow profile into a plurality of strips wherein each strip encoded into a unique instruction.

50. (New) The method according to claim 49, further comprising encoding a look ahead into each instruction comprising:

if the last column position of a bow profile strip in a first instruction indicates a process direction shift:

encoding a look ahead bit in the corresponding instruction with a value corresponding to the direction of the shift; and

clearing the value of the first column of the corresponding bow profile strip in the next instruction.